MC3000 Embedded Barcode QR Code Scanner

User Settings Manual (Serial Port)

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This manual mainly provides various function setting commands for barcode reading equipment. By getting familiar with the introduction of various function commands in this manual, you can change the function parameters of the barcode reading device. The product has set the parameter configuration suitable for most common functions by default when leaving the factory. In most cases, users can put it into use without making adjustments.

Note：

1、All setting parameters with * are system default parameters.

2、The CRC check included in the command of this document is CRC16_XMODEM: polynomial x16+x12+x5+1 (0x1021)

1 System Settings

1.1 Setting Code Switch

Close the setup code: After the shutdown, you can not configure the parameters by scanning the setup code. The setup code is always regarded as a normal barcode.

Close the setup code command:"$010000-525C".

Enable setup code: You can configure the parameters by scanning the setup code.

The setup code command is:"$010001-616D"; the default is to enable the setup code.

Note: These two commands can only be set via commands such as UART.

Set code content output switch

$010100-24E8
(***** Do not Output the Setting code Content)

$010101-17D9
(Output Setting code Content)

1.2 Parameter Management

Restore factory settings: Restore all parameters to the factory configuration, and the device will restart automatically after this operation.

$010200-BF34
(Restore Factory Settings)

Save current settings as user default settings: Save the current device configuration as user default settings. If user default settings have been set, the new configuration will replace the original user default settings after this operation.

Restore user default settings: Restore all parameters to the user's default settings, and the device will restart automatically after this operation.

$010201-8C05
(Save Current Settings as user Default Settings)

$010202-D956
(Restore user Default Settings)

1.3 Device Information

Read device information: The firmware version information can be read.

$010300-C980 (Read Device Information)

1.4 Device Restart

Device restart: The device will restart immediately after scanning the setting code or sending the setting command.

$010500-EE19 (Device Restart)

1.5 Heartbeat Query

The host can check whether the code scanning module has heartbeat response by sending the heartbeat query command to determine whether the code scanning module is working normally.

Heartbeat Query:$01036F-D9DF

Heartbeat Response:$010370-4C10

2 Communication Settings

The device can not only read the corresponding QR code in the manual to set the parameters, but also send the string command under the QR code in the manual through the serial port to set the parameters. When sending the command through the serial port, pay attention to whether the baud rate and other parameters are consistent with the device.

2.1 Serial Port Baud Rate Setting

Serial port parameters are set as: data bit 8, parity check none, stop bit 1, no flow control. The baud rate is 9600bps by default.

$020503-75AA （Baud Rate 2400）

$020504-EC3D （Baud Rate4800）

$020505-DF0C （* Baud Rate9600）

$020506-8A5F （Baud Rate19200）

$020507-B96E （Baud Rate38400）

$020508-A950 （Baud Rate57600）

$020509-9A61 （Baud Rate 115200）

2.2 Host Command Response Mode

Response mode 1: Response is fixed content.

The command execution success response is:$000100-6148;

The command execution failure response is: $0001FF-A91F.

Response mode 2： The first 5 characters of the response are the same as the first 5 characters sent to the device command; the 6th to 7th characters, the command execution success is: "00"; the command execution failure is: "FF"; the 8th character is a fixed character "-"; The 8th to 12th characters are CRC16 checksums.

Note: (1). The command to read the class (such as: read device information) does not answer, directly reply to the read content;

(2). Sending "Enter Online Upgrade Status" will only reply to the successful execution of the command, which only means that the command has been received.

$020B00-33A1

（***** No Response）

$020B01-0090

（Response Mode 1）

$020B02-55C3

（Response Mode 2）

3 Reading Parameter Setting

3.1 Reading Mode

To adapt to different scenes, the scanning module has multiple reading modes, and the default is automatic sensing reading mode. The settings take effect immediately.

Continuous Reading Mode: The device reading will be on continuously, and will not be affected by the "single reading duration".

Automatic Sensing Mode: When a bar code enters the field of view of the device or presses the button once,The device will start reading once.When the reading is successful or the reading exceeds the "single reading duration", the reading will be stopped.

$100003-FACE

(Continuous Reading)

$100004-6359

(* Automatic Sensing)

3.2 Command Read Mode

The command reading mode shall be applicable to the automatic sensing mode under the serial port output state. The command triggering reading under the command triggering mode is as follows:

In the "automatic Sensing" mode, the upper computer can trigger the device to start reading by sending a command;

Command trigger 1: The reading is triggered after the command is sent. When the reading succeeds or exceeds the "single reading duration" or the "command triggered stop" is received, the device stops reading;
The command is:$108000-ADB0

Command trigger 2：After the command is sent, the continuous reading is triggered, and the device stops reading only after sending the “Command Trigger Stop”;
The command is:$108001-9E81

Command trigger stop: Used to stop reading triggered by "Command Trigger 1" and "Command Trigger 2".
The command is:$108003-F8E3

3.3 Reading Sensitivity Setting

This setting is only effective when the "Reading Mode" is "Automatic Sensing"; The higher the sensitivity is, the easier it is to trigger the device to enter the reading state. The lower the sensitivity is, the harder it is to trigger the device to enter the reading state. You need to set the sensitivity according to different scenarios. Generally,you can use the default setting.

$100100-D929 (Highest Sensitivity)

$100101-EA18 (High Sensitivity)

$100102-BF4B (* Medium Sensitivity)

$100103-8C7A (Low Sensitivity)

$100104-15ED (Minimum Sensitivity)

3.4 Automatic Induction Restart Delay Setting

This setting is only effective when the "Reading Mode" is "Automatic Sensing"; It is used to set the delay time of the next automatic induction start after reading the barcode; It is recommended not to set the delay too short, otherwise it is easy to generate multiple reads for one scan.

$101304-52D4 (0.3 Second)

$101306-34B6 （*0.5 Second）

$101308-17B9 （0.7 Second）

$10130C-C31A （1 Second）

3.5 Single Reading Time

This setting is valid only when the “read mode” is “one-shot”, “key hold”, “auto-sensing”; when the reading time exceeds “single read time”, the device will stop reading.

$100200-42F5 (Unlimited Time)

$100203-17A6 （3 Second）

$100206-E853（*6 Second）

$100209-F86D （9 Second）

$10020F-E00A （15 Second）

3.6 Reading Interval

This setting is only effective when the "Reading Mode" is "Automatic Sensing", "Continuous Reading", and "On/Off Continuous"; It is used to adjust the interval time of barcode reading to prevent multiple reading of the same barcode due to too fast reading speed.

By default, the code scanning interval is **0.5 seconds.**

No repeated output of adjacent barcodes within x seconds: The same barcode must leave the reading area for more than x seconds before it can be read again.

$100300-3441 (No Interval)

$100305-CBB4（*0.5 Second）

$10030A-0F29 （1 Second）

$100314-CFB5 （2 Second）

$1003F0-5EE9 (No Repeated Output Within 1 Second for adjacent Barcodes)

$1003F2-388B (No Repeated Output Within 2 Second for adjacent Barcodes)

$1003F3-0BBA (No Repeated Output Within 3 Second for adjacent Barcodes)

$1003FF-FC16 (Adjacent Barcodes Must be Different)

3.7 USB HID Keyboard Output Interval

USB HID keyboard is transmitted one character at a time. You can change the character output speed of the embedded scanner to meet the requirements of the host through this setting. The default is 10ms interval.

$020700-CD91 (No Interval)

$020705-3264 (Interval 5ms)

$02070A-F6F9 (*Interval 10ms)

$020714-3665 (Interval 20ms)

$02071E-0D0D (Interval 30ms)

$020732-F2A3 (Interval 50ms)

3.8 USB HID Keyboard Output Chinese Setting

USB HID keyboard output Chinese is currently only applicable to Windows systems, and it does not support Chinese output on Android and Linux devices. Chinese output is turned off by default.

* Turn off USB HID Keyboard Chinese Output

Turn on USB HID Keyboard Chinese Output

4 Lighting and Aiming

4.1 Lighting

The lighting lamp can provide auxiliary lighting for photographing and reading. The light beam shines on the reading target to improve the reading performance and adaptability in low light environment. You can set it to one of the following states according to the application environment: (it is lit when reading by default)

Always on Light: after the equipment is turned on, the lamp will continue to light up; It is recommended to set it as normally lit when the reading environment is dark or there is no light at all.

No Lighting: under any circumstances, the lamp does not light up; It is recommended to set no lighting when the reading object is the screen.

On When Reading: the lamp lights up when reading and goes out at other times.

$140000-A93C
(Always on Light)

$140001-9A0D
(No Lighting)

$140002-CF5E
(* On When Reading)

4.2 Lighting Control Mode

The lighting control mode supports PWM control or level control. When it is PWM mode, the lighting brightness can be set, and when it is level mode, whether the lighting is on at low level or on at high level can be set. The default is PWM control. The following setting code can be used to set the lighting brightness.

$382500-3AFA
Electrical Level Mode

$382501-09CB
*PWM Mode

4.3 Lighting Lamp Operating Level Setting

Note: It is required to set the lamp as the level mode first, and the setting will take effect immediately. Restoring the factory setting will restore the default value.

$382600-A126
Lighting Lamp is on at Low Level

$382601-9217
* Lighting Lamp is on at High Level

4.4 Illumination Lamp Brightness Setting

The brightness can only be set when the lighting control mode is PWM.

$150900-1FEB （Dim Brightness)

$150901-2CDA (* Moderate Brightness)

$150902-7989 （High Brightness)

$150903-4AB8 (Highest Brightness)

4.5 Aiming Lamp

Aiming Lamp Mode

The aiming beam can help users find the best reading distance when shooting and reading. Only modules with aiming lights have this function. The user can select any of the following modes according to the application environment (the default is to aim when reading):

Always on Light: Continuously project the aiming beam.

No Aiming: The aiming beam is extinguished in any case.

Aim When Reading: The aiming beam is projected only when reading.

$140100-DF88

（Always on Light）

$140101-ECB9

（No Aiming）

$140102-B9EA

（* Aim When Reading）

4.6 Aiming Lamp Flicker

Whether the aiming lamp flashes when it is turned on. By default, it flashes when it is turned on.

$140104-134C (No Flicker)

$140105-207D (*Flicker)

4.7 Lighting Lamp Control Signal Output

If enabled, the lighting control signal will be output from the LED indicator control IO port. High level indicates that the lighting is on;

Low level indicates that the lighting is off; After enabling, the original LED indicator function will automatically fail, and the equipment's own light will be turned off.

$150600-CB05 （* Forbid）

$150601-F834 （Enable）

5 Output Prompt

5.1 Power on Prompt

Power on prompt: if it is turned on, the buzzer and lighting lamp will send out a prompt signal after the device is successfully started.

$150000-EC9C
(Turn off the Power on Prompt)

$150001-DFAD
(* Enable power on prompt)

5.2 Read the Prompt Tone

Read the Prompt Tone: If it is turned on, the buzzer will ring once every time the reading is successful.

$150100-9A28
(Turn off the Recognition Prompt Tone)

$150101-A919
(* Enable Reading Prompt Tone)

5.3 Set Prompt Tone

If the setting prompt tone is turned on, the buzzer will ring according to the setting result each time the parameter is set (3 rings for successful setting, 1 long ring for failure). On by default.

$150A00-D85D
(Turn off the Setting Prompt Tone)

$150A01-EB6C
(* Enable Setting Prompt Tone)

5.4 LED Light Indication

LED light indication: if it is turned on, the LED light will flash once after each successful reading. On by default.

$150200-01F4 (Turn off LED Indicator)

$150201-32C5（* Turn on LED Indicator）

5.5 Singing Duration

Singing Duration: By changing the setting of this parameter, you can adjust the duration of a buzzer.

$150303-2213（Singing Duration30ms）

$150306-DDE6（Singing Duration*60ms）

$15030C-2A4A （Singing Duration120ms）

$150314-8CB4 （Singing Duration200ms）

5.6 Buzzer Signal Output Mode

Set the buzzer control signal, and the default is PWM signal to control the buzzer output. This setting will not take effect immediately. After setting, it will take effect only after manual restart, and restoring factory settings will not change the original settings.

$150400-266D （* Level Output）

$150401-155C （PWM Output）

5.7 Buzzer Frequency Regulation

This function can be set only when the buzzer control signal is PWM mode (control signal output can be set in Section 6.8). According to the frequency of the buzzer, set the appropriate control frequency, which is 2.7KHZ by default.

$150705-4244 （Buzzer Frequency2KHz）

$150706-1717（Buzzer Frequency2.4KHz）

$150707-2426（* Buzzer Frequency2.7KHz）

$150708-3418（Buzzer Frequency4KHz）

5.8 Buzzer Loudness Adjustment

In PWM mode, adjust the loudness of the buzzer.

$150801-5A6E（Loudness Level High）

$150802-0F3D（* Moderate loudness）

$150803-3C0C（Loudness Level Low）

$150804-A59B（Loudness Level Minimum）

5.9 Buzzer Working Level

The setting is only valid when the buzzer signal output mode is "level output"

$382800-037C

The Buzzer Sounds at Low Level

$382801-304D

*The Buzzer Sounds at High Level

5.10 Power on Command Prompt

If enabled, after the device is started, the command "$150600-CB05" will be sent to the host, indicating that the device is ready.

$150500-50D9 （* Forbid）

$150501-63E8 （Enable）

6 Data Editing

6.1 Prefix

This function is to add a prefix to identify the result. After this function is enabled, if the reading is successful, the corresponding prefix will be added in front of the data.

Add Prefix:

$202004-HEAD-7591（Example 1）

$202020-HEAD0123456789abcdef-5B3E（Example2）

Format setting description:

$2020	Prefix identification
4	Length of prefix content
HEAD	Prefix content (1-20 bytes)
7591	CRC Verify ($202004-HEAD -)

To set the prefix of hexadecimal, all characters should be converted to hexadecimal, and the corresponding CRC check should also be the CRC check after conversion to hexadecimal.

For example, prefix: 0x00 0xff

Sending hexadecimal data is: 0x24 0x32 0x30 0x32 0x30 0x30 0x32 0x2d 0x00 0xff 0x2d 0x37 0x33 0x43 0x30

Where prefix ID: 0x24 0x32 0x30 0x32 0x30 ($2020)

Length: 0x300x32 (02)

Connection symbol-: 0x2d

Prefix content: 0x000xff

Connection symbol-: 0x2d

CRC Verify: 0x37 0x33 0x43 0x30

Note: The CRC check result of 0x24 0x32 0x30 0x30 0x30 0x32 0x2d 0x00 0xff 0x2d is 0x73 0xC0. You need to convert the "73C0" string to the value 0x37 0x33 0x43 0x30 corresponding to the hexadecimal system (the 'A', 'B', 'C', 'D', 'E' and 'F' contained in the CRC string must be uppercase).

Clear Prefix:

$202000-339C（Clear Prefix）

6.2 Suffix

This function is to add a suffix to identify the result. After this function is enabled, if the reading is successful, the corresponding suffix will be added after the data.

Add Suffix:

$202104-TAIL-FB3A （Example 1）

$202120-LIAT0123456789abcdef-E0BB（Example 2）

Setting Description:

$2021	Identification of suffix
4	Length of suffix content
TAIL	Suffix content (1-20 bytes)
FB3A	CRC check ($202104-TAIL -)

To set the hexadecimal suffix, please refer to the setting formula of the hexadecimal prefix.

Clear Suffix:

$202100-4528（Clear Suffix）

6.3 Enable CRC Verification

This function is to add CRC verification function to identification data, including prefix part, data part and suffix part; The terminator is not included.

$202301-9B71 （CRC Enable）

$202302-CE22 （CRC Forbid）

6.4 End Symbol

This function is to enable the host to quickly distinguish the current read results. After this function is enabled, if the reading is successful, the corresponding terminator will be added after the data.

$201000-DD4E (* Close terminator)

$201001-EE7F [Tab terminator TAB (0x0B) added]

$201002-BB2C

【Add end of carriage return CR (0x0D)】

$201003-881D

【Add the end character CRLF (0x0D, 0x0A) of carriage return line break】

6.5 User Data Filtering Rules

This function is used to filter and identify the filter target character data contained in user data. After this function is enabled, if the reading is successful, a string of data equal to the filtered character data will be deleted from the user data.

$202202-a0-B912(Example)

Setting Description:

$2022	Commands for Setting Filtering Functions
2	The Data Length of the Filtered Data Part
a0	Content of Filtered Data (1-20 bytes)
B912	CRC check ($202202-a0 -)

Please refer to the setting method of hexadecimal prefix for setting hexadecimal user data filtering rules. Data to filter (example):

The following two examples are used to test the filter rule "a0". After scanning the code or sending the filter rule "$202202-a0-B912" through the serial port, scan the following two data examples. The "a0" contained in the string will be filtered out.

1234aa0056（Data）

a00b00c00（Data）

Scan result after setting "$202202-a0-B912": "1234aa0056" scan result is "1234a056" "a00b00c00" scan result is "0b00c00"

Clear Filter Settings:

$202200-DEF4 （Clear Filter Settings）

7 Barcode Reading Forbid/Enabled

7.1 All Barcodes

$280101-3FD8(Allow to Read all Types)

$280102-6A8B (* Open the Default Read Type)

$280103-59BA (Forbid to Read all Barcodes)

$280104-C02D (Allow to read all barcodes)

7.2 UPCA

$290100-4949 (Forbid Reading UPCA)

$290101-7A78 （*Allow Reading UPCA）

7.3 UPCE

$290200-D295（Forbid Reading UPCE）

$290201-E1A4（*Allow Reading UPCE）

7.4 EAN13

$290300-A421（Forbid ReadingEAN13）

$290301-9710（* Allow ReadingEAN13）

7.5 EAN8

$290400-F50C（Forbid ReadingEAN8）

$290401-C63D（*Allow Reading EAN8）

7.6 CODE39

$290500-83B8
（Forbid Reading CODE39）

$290501-B089
（*Allow ReadingCODE39）

7.7 CODE128

$290700-6ED0（Forbid ReadingCODE128）

$290701-5DE1（*Allow ReadingCODE128）

7.8 Cross 25 Yards

$290A00-0B3C(Forbid Cross Reading 25)

$290A01-380D（*Allow Cross Reading 25）